

FIG. 1A

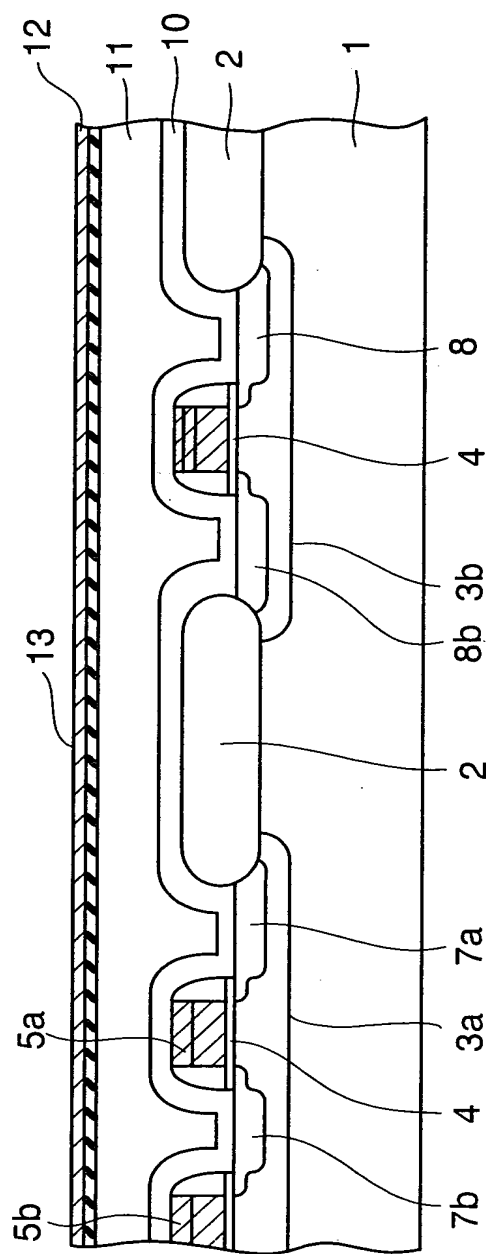


FIG. 1B

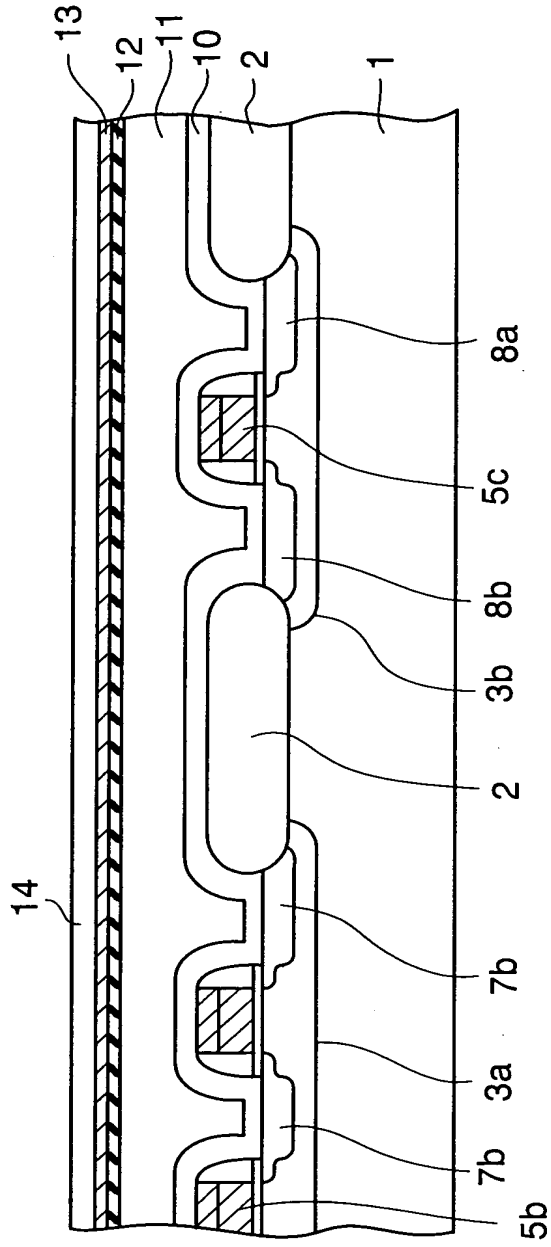


FIG. 1C

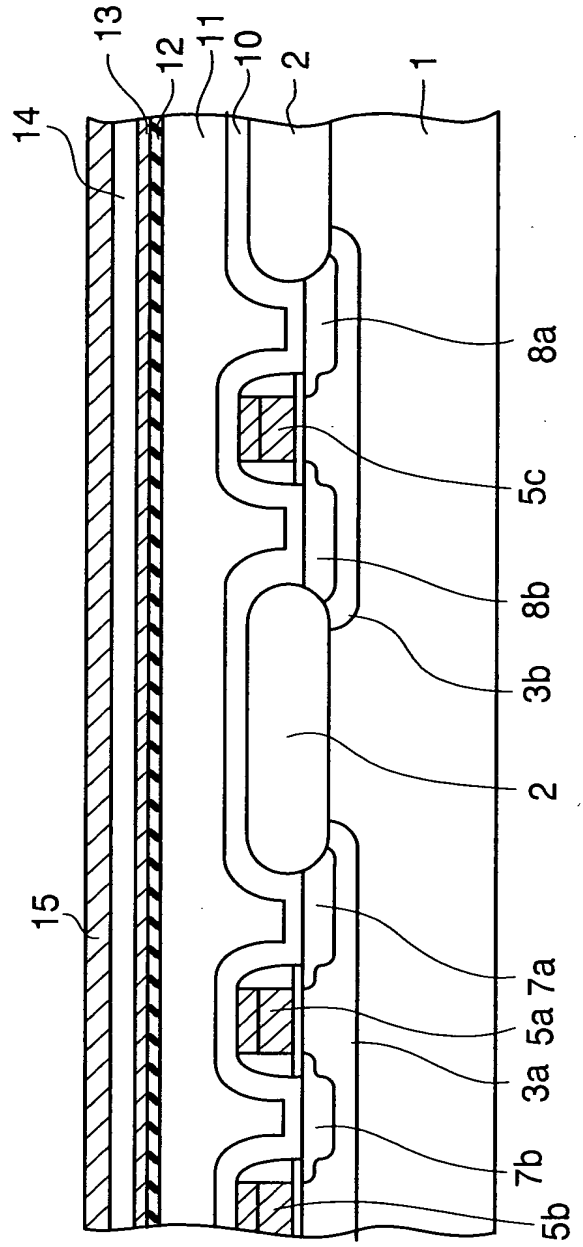


FIG. 1D

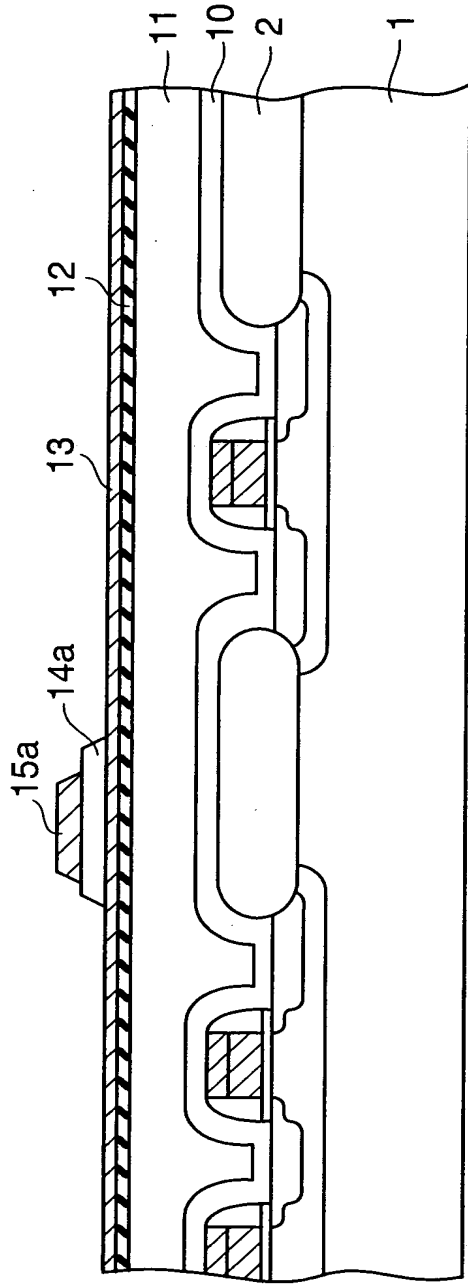


FIG. 1E

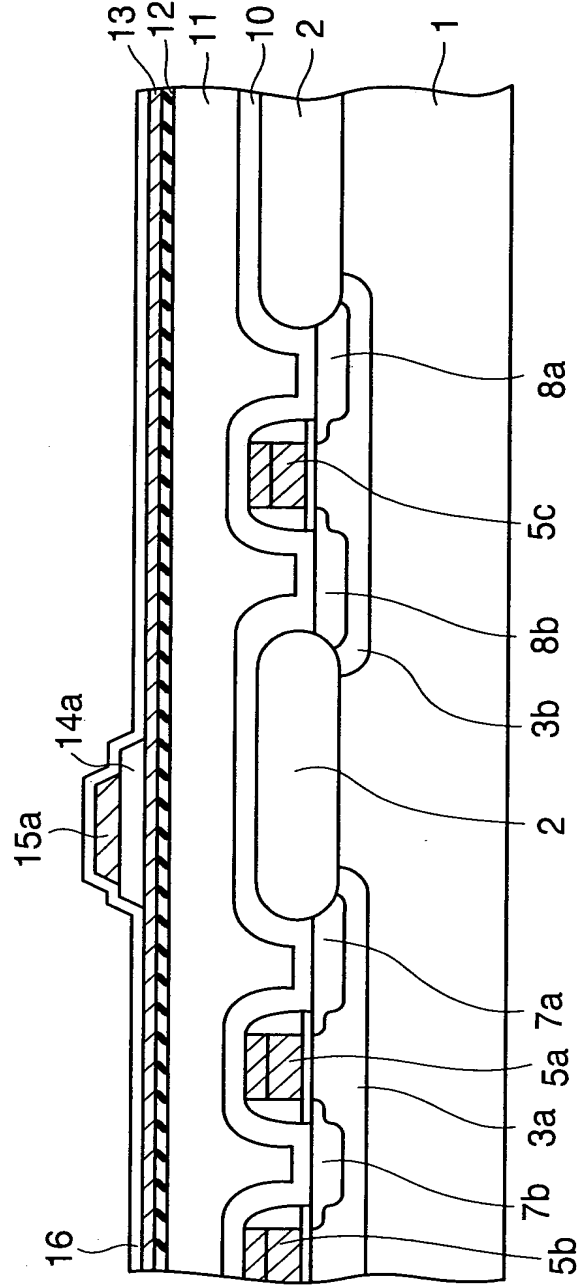


FIG. 1F

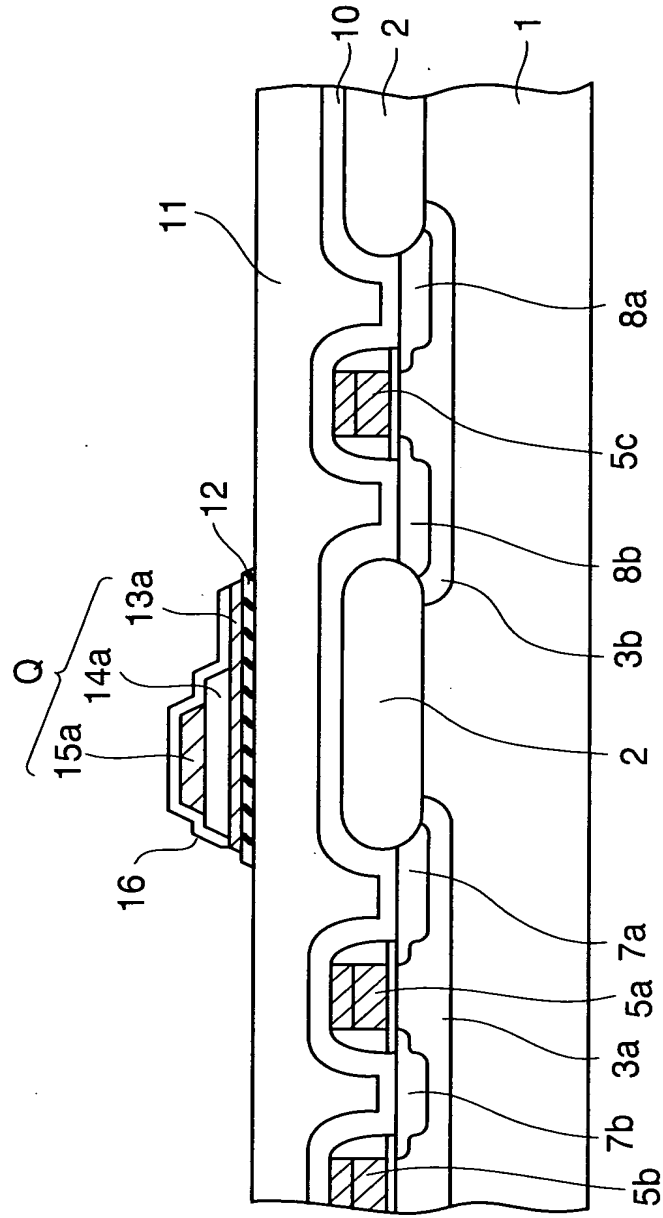


FIG. 1G

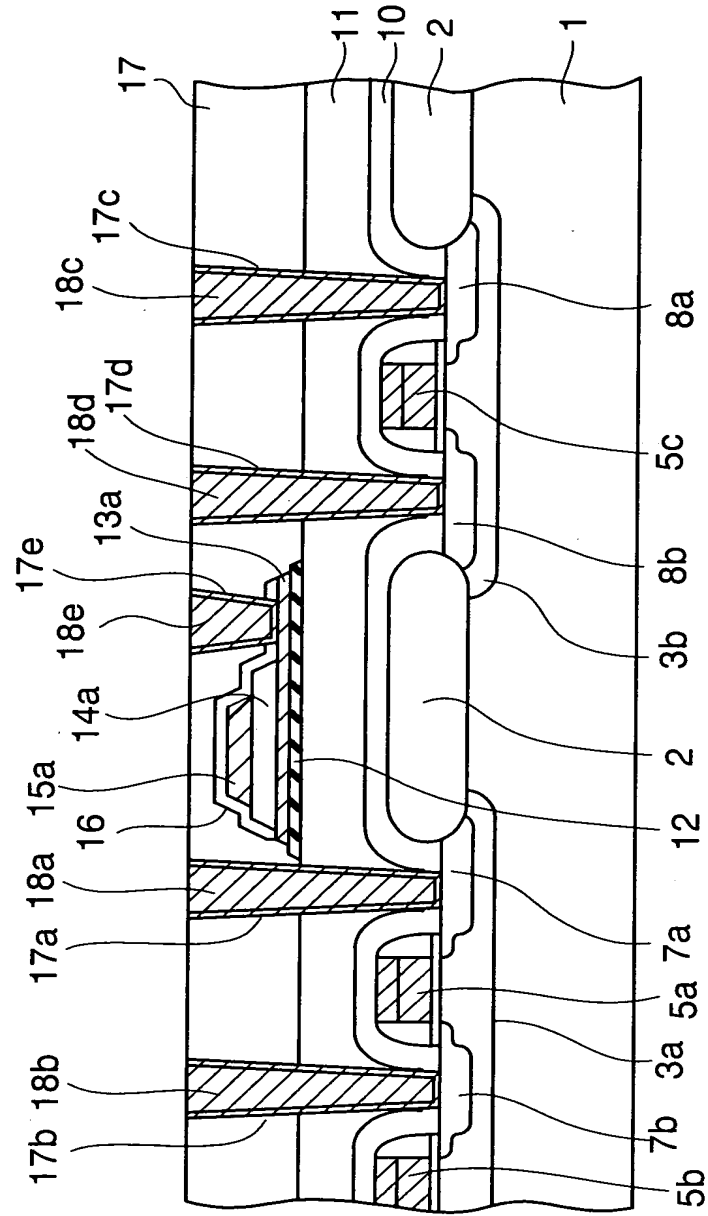


FIG. 1H

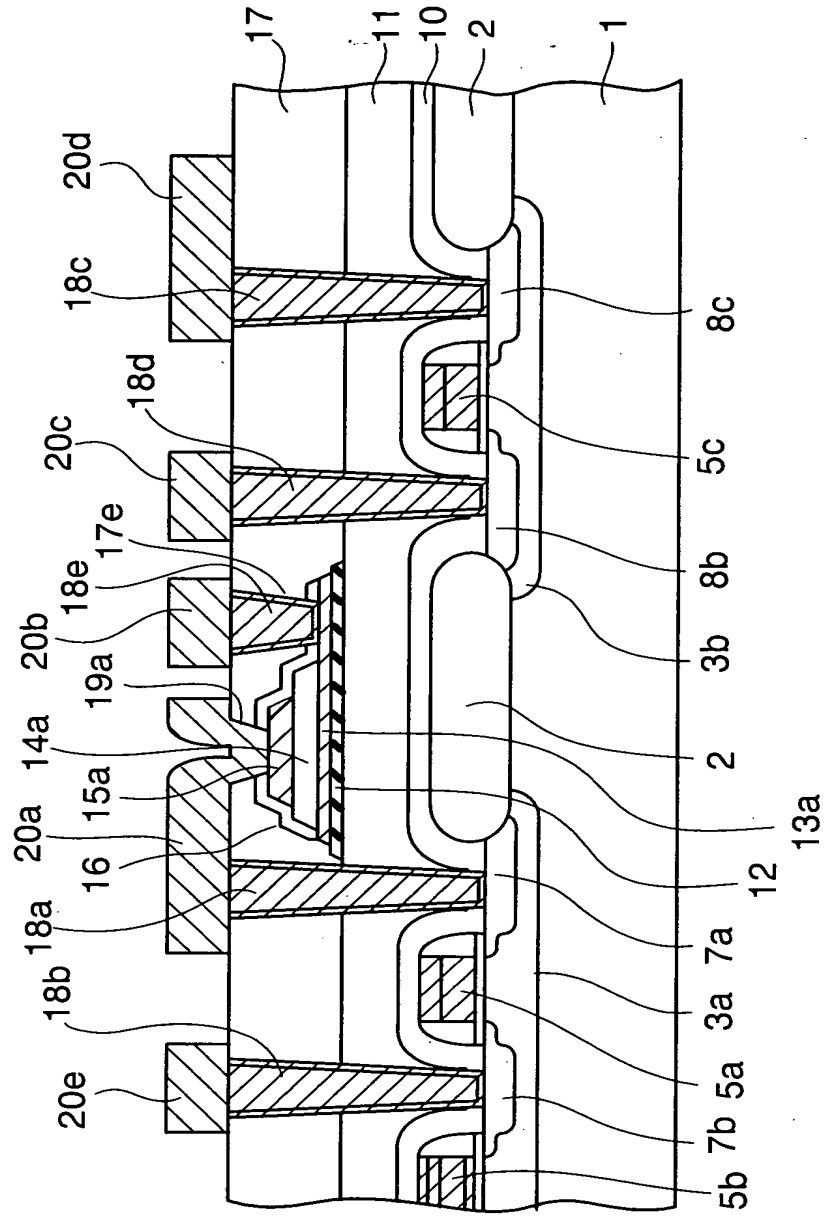


FIG. 1I

FIG. 2

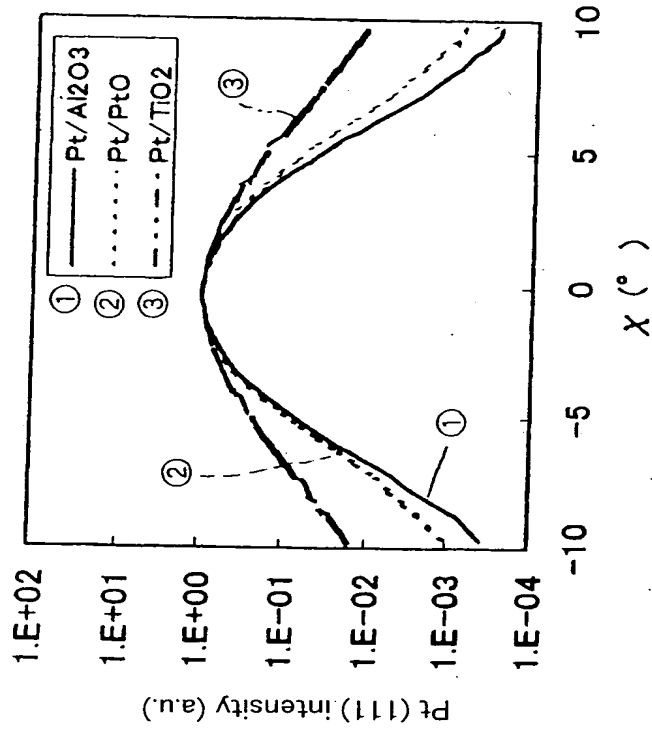


FIG. 3

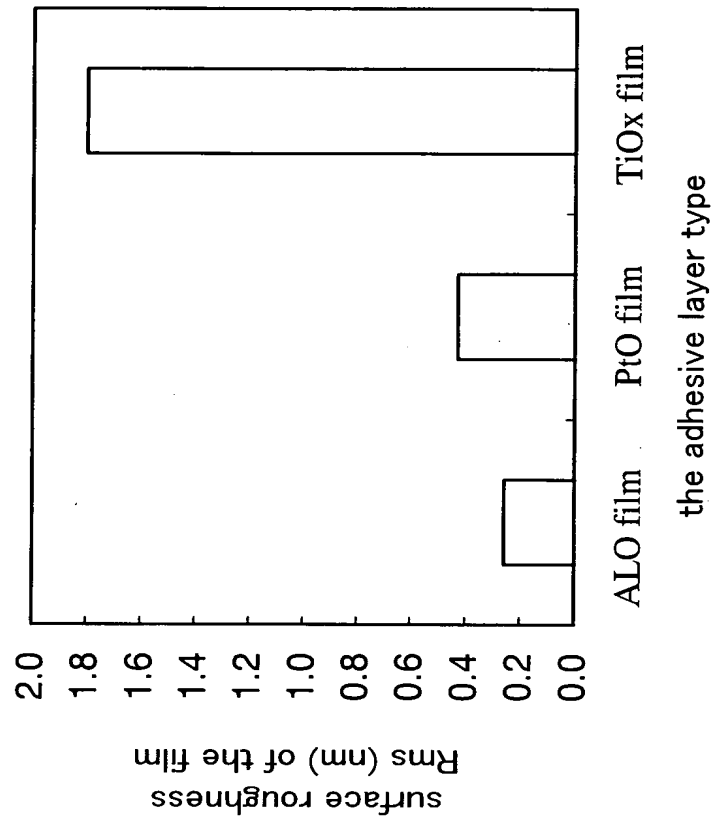




FIG. 4

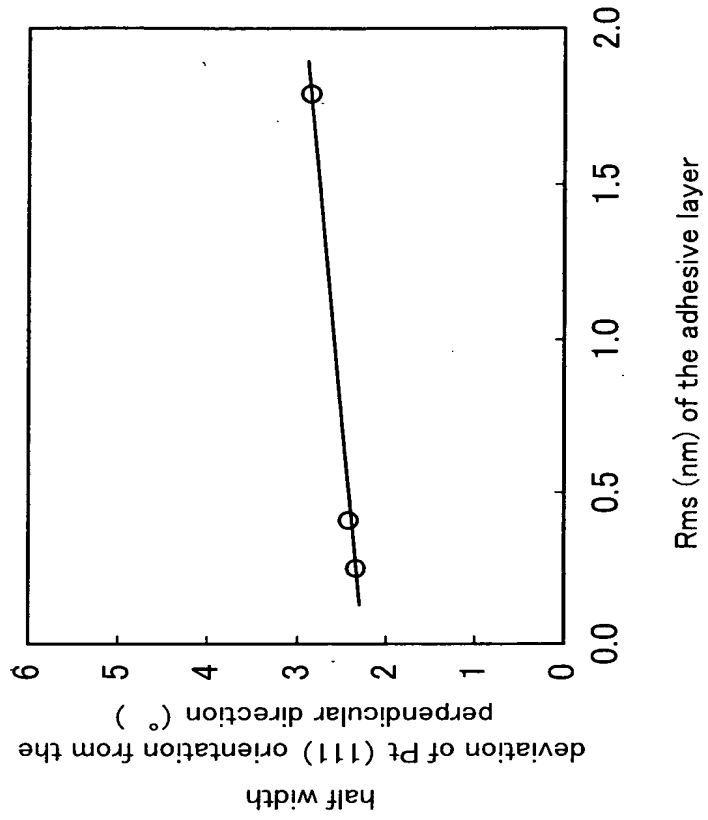


FIG. 5

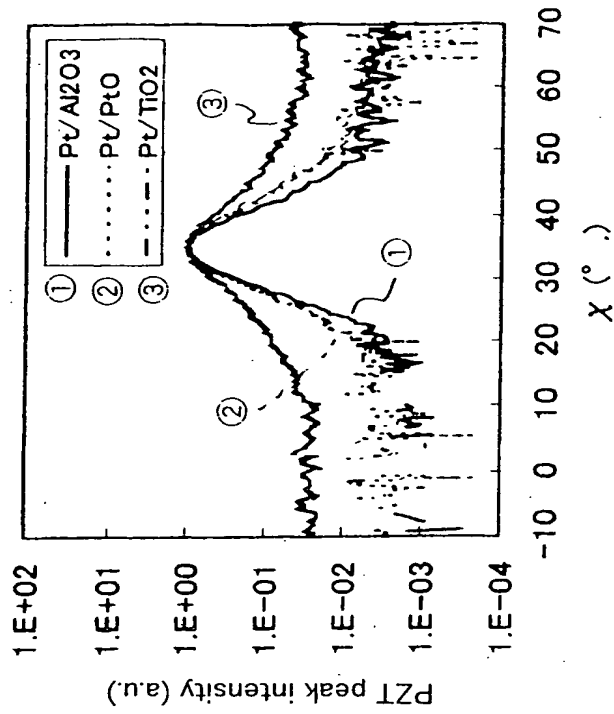


FIG. 6

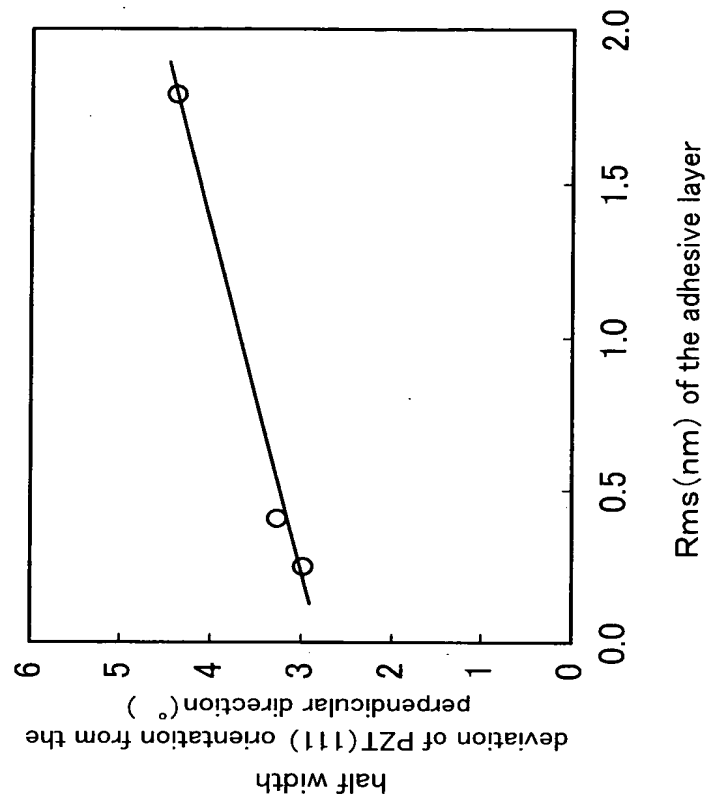


FIG. 7

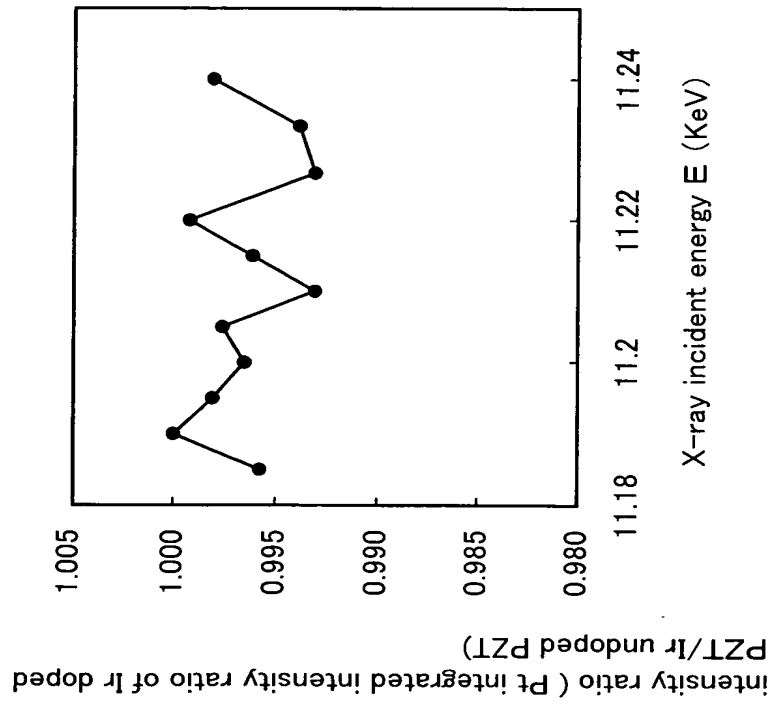


FIG. 8

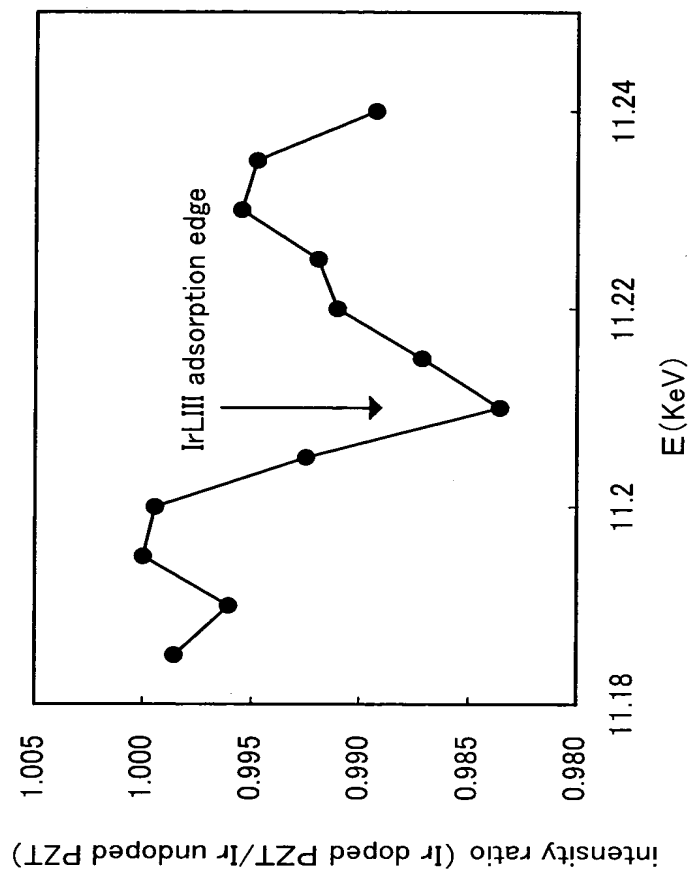
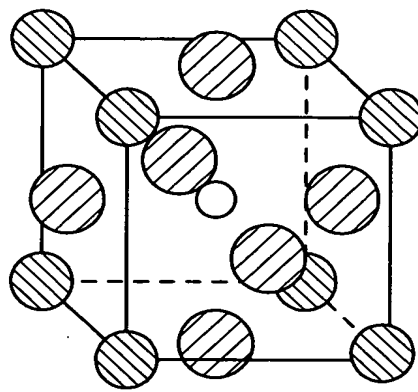


FIG. 9



crystal lattice of  $ABO_3$  structure material according to the first embodiment of the present invention

A site atom



•Bi, Pb, Ba, Sr, Ca, Na, K, Ir, rare earth element

B site atom



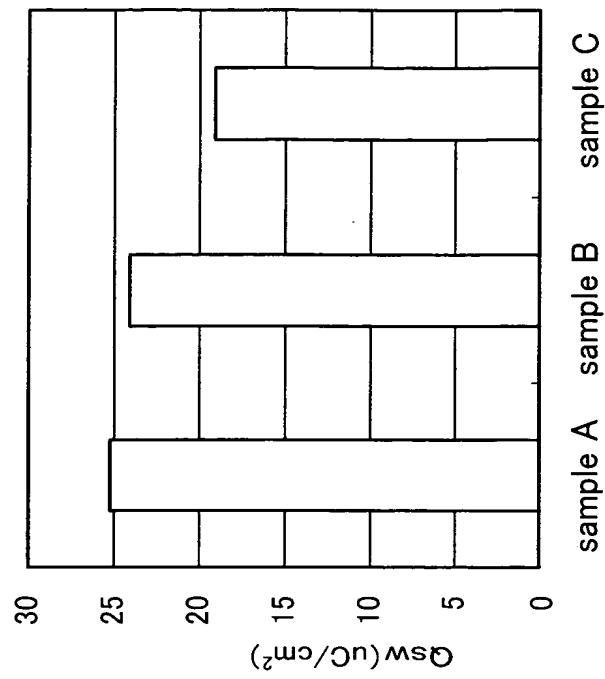
•Ti, Zr, Nb, Ta, W, Mn, Fe, Co, Cr, Ir

O atom



The Ir atom is contained in at least one of the A site atom and the B site atom.

FIG. 10



sample A: IrOx/Ir doped PZT/Pt/Al<sub>2</sub>O<sub>3</sub>  
 sample B: IrOx/Ir doped PZT/Pt/TiOx  
 sample C: IrOx/PZT/Pt/Ti

Rms of Al<sub>2</sub>O<sub>3</sub> = 0.23nm  
 Rms of TiOx = 1.8nm  
 Rms of Ti = 0.76nm

FIG. 11

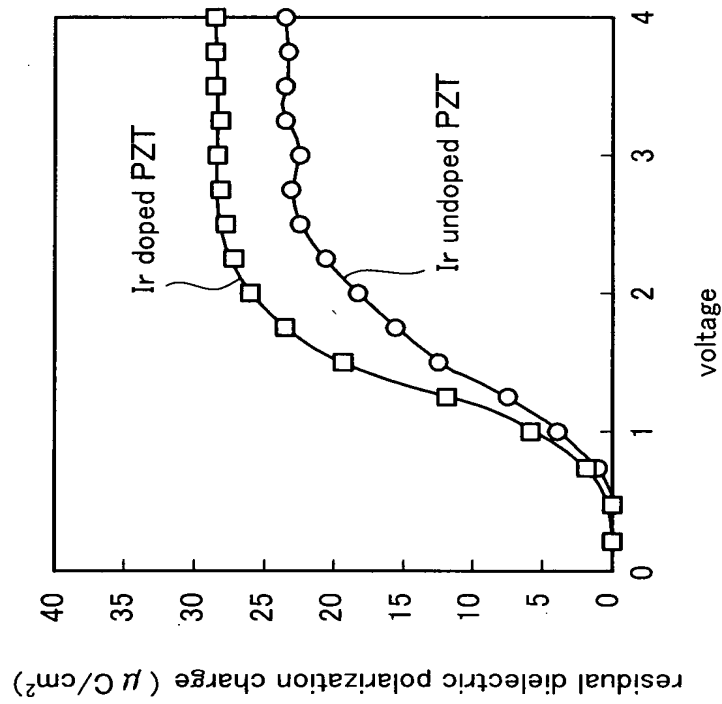


FIG. 12

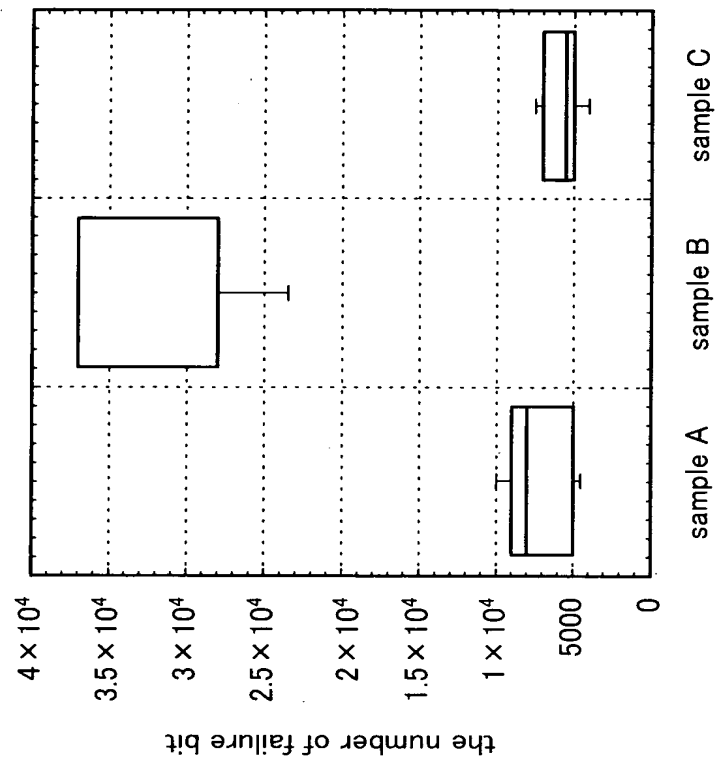


FIG. 13

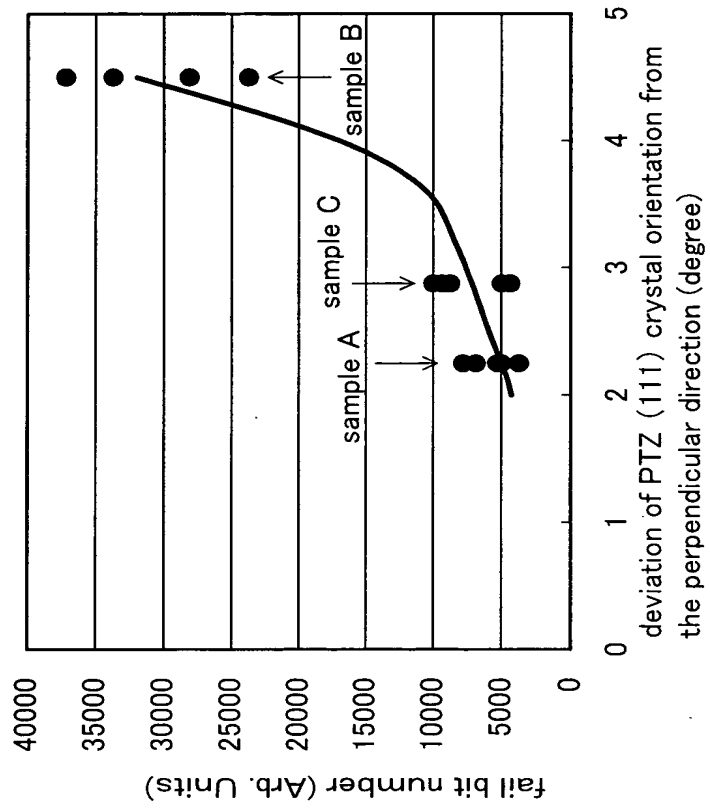


FIG. 14

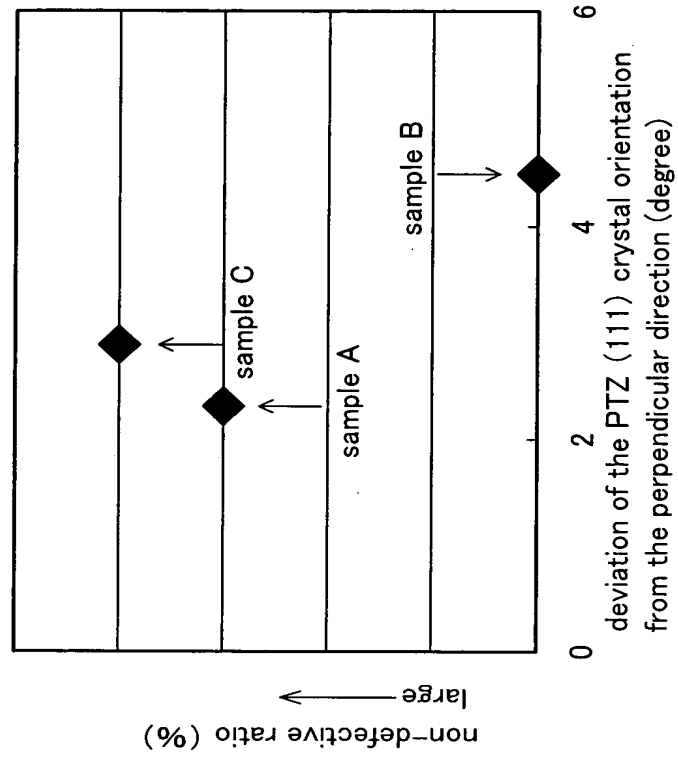


FIG. 15

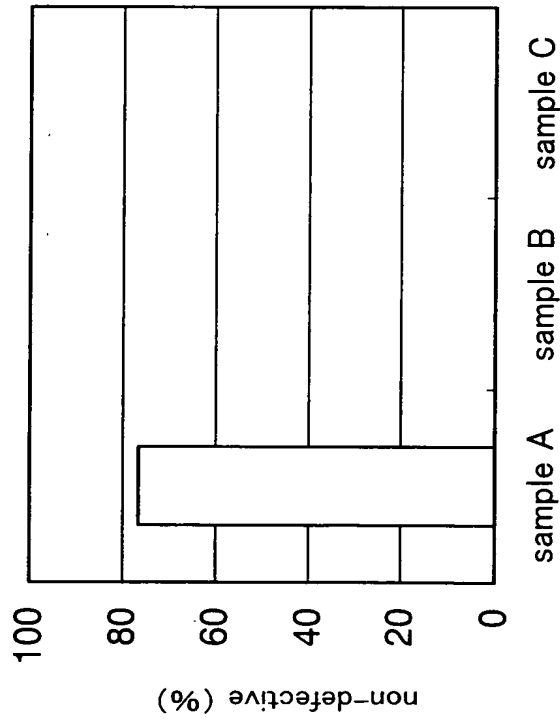




FIG. 16

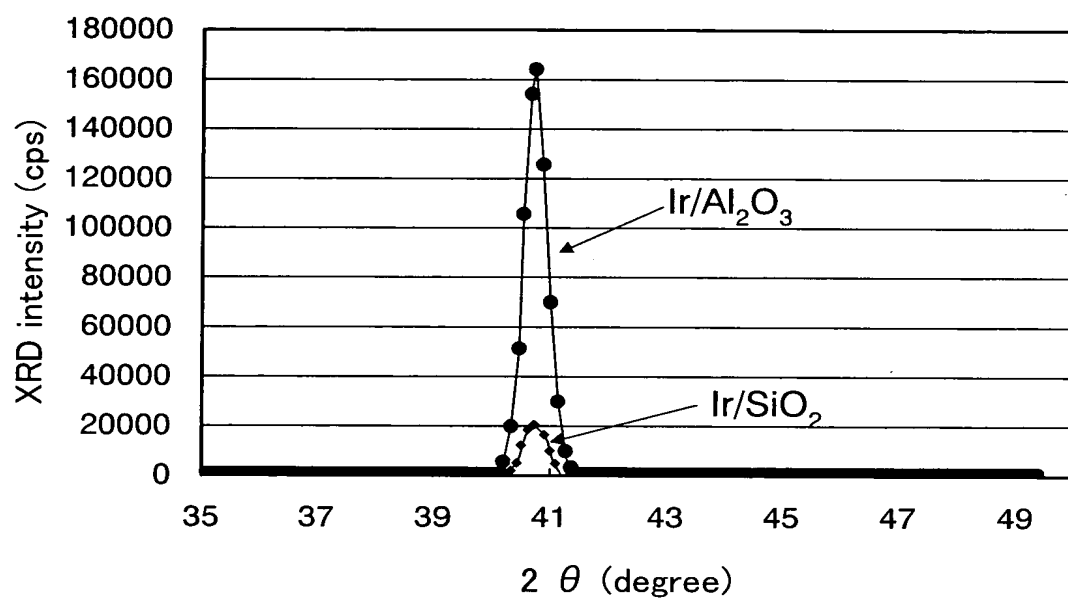


FIG. 17

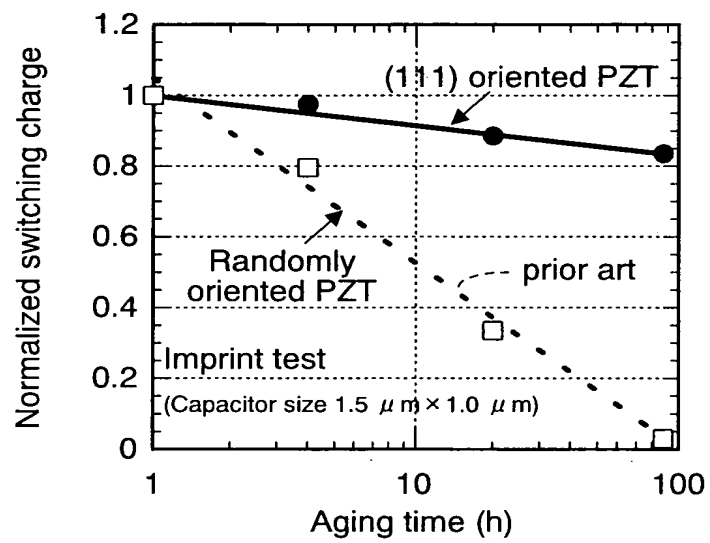


FIG. 18A

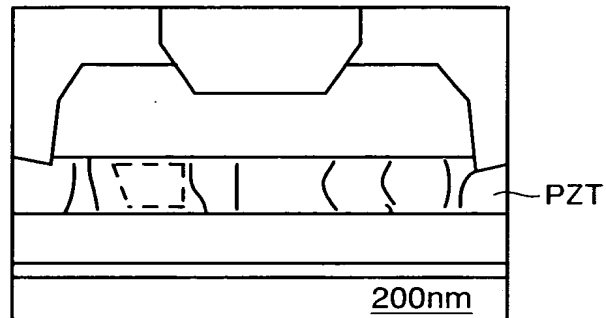


FIG. 18B

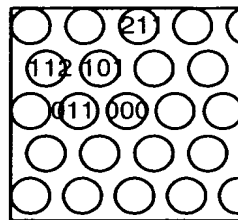


FIG. 19

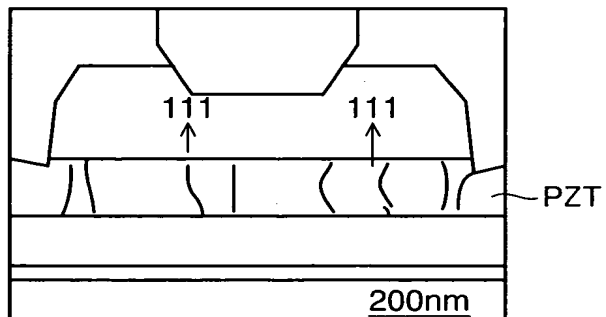


FIG. 20A

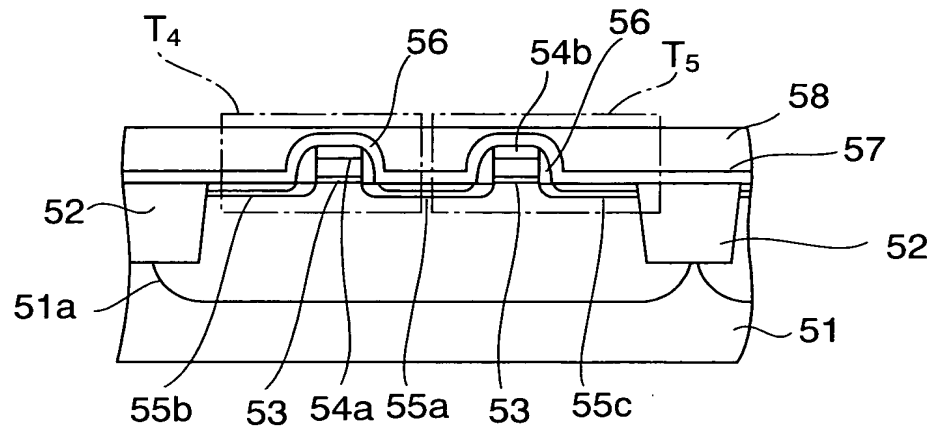


FIG. 20B

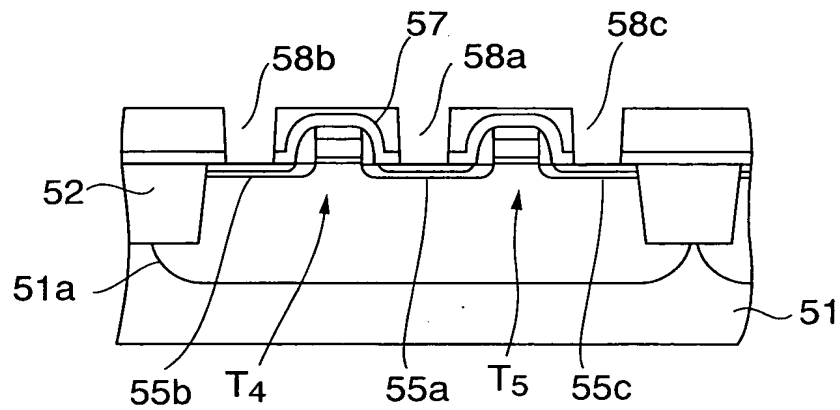


FIG. 20C

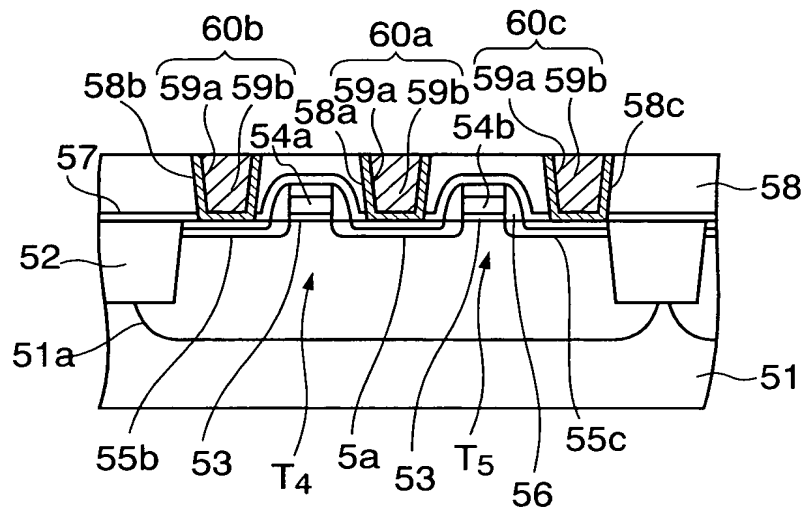


FIG. 20D

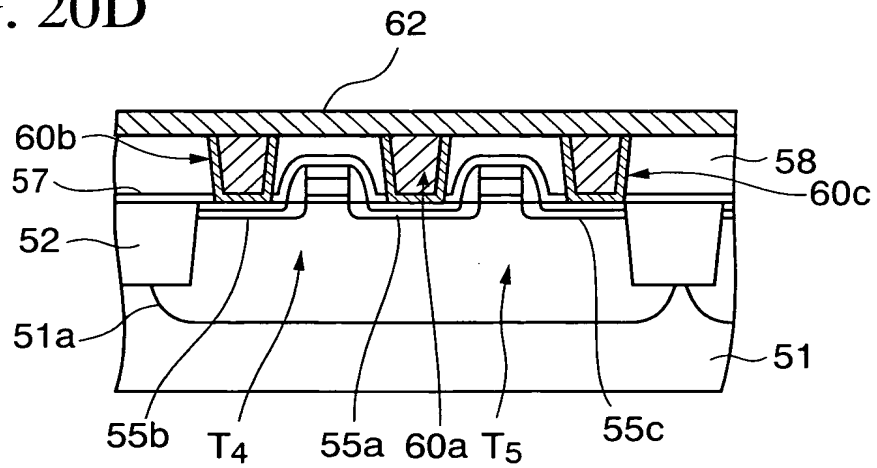


FIG. 20E

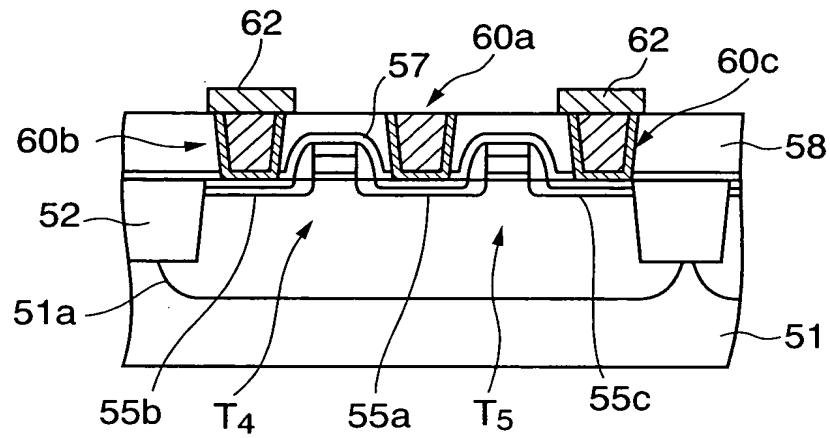


FIG. 20F

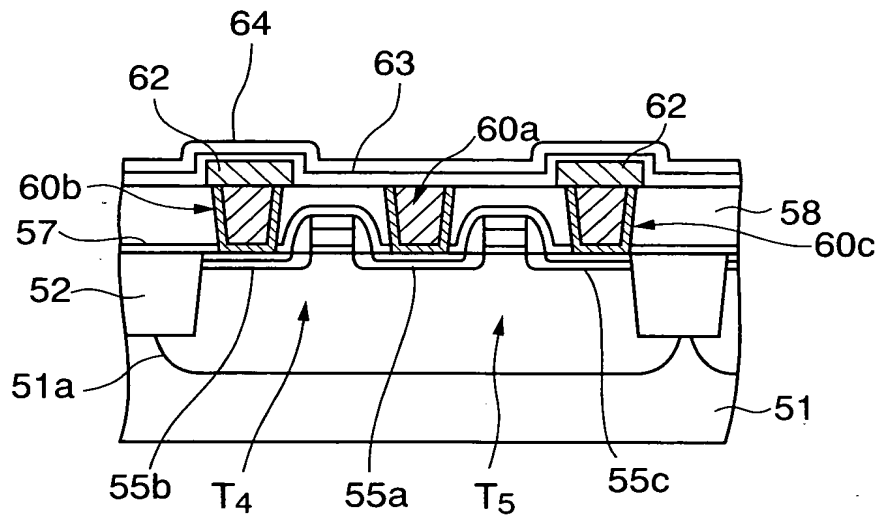


FIG. 20G

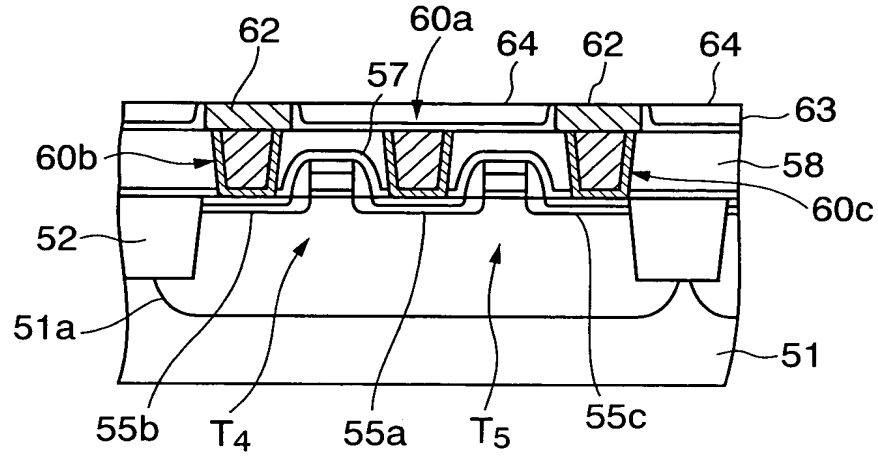
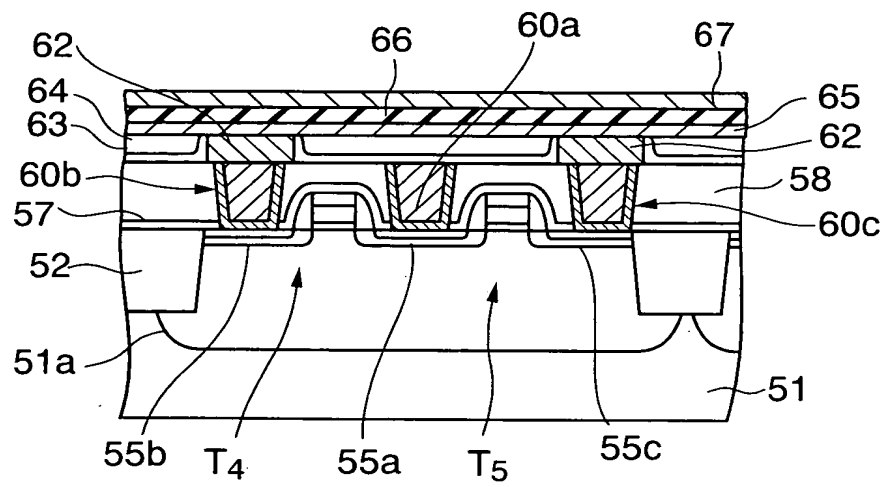
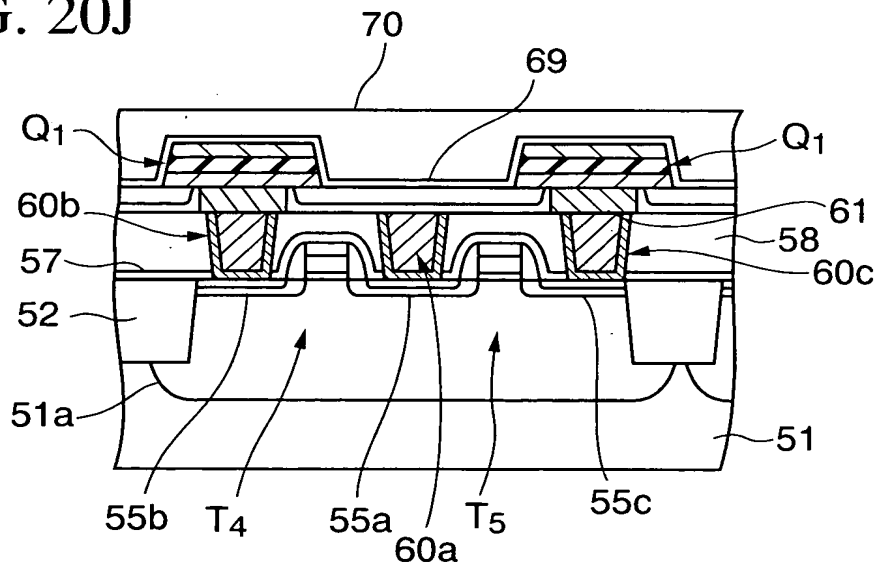


FIG. 20H







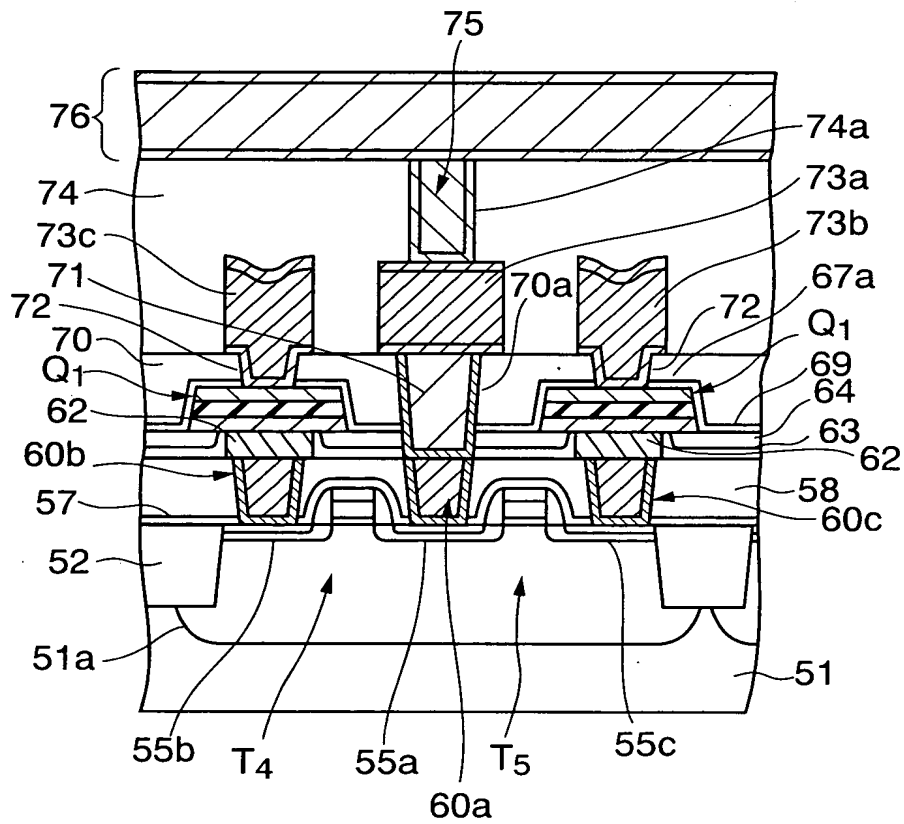


FIG. 21A

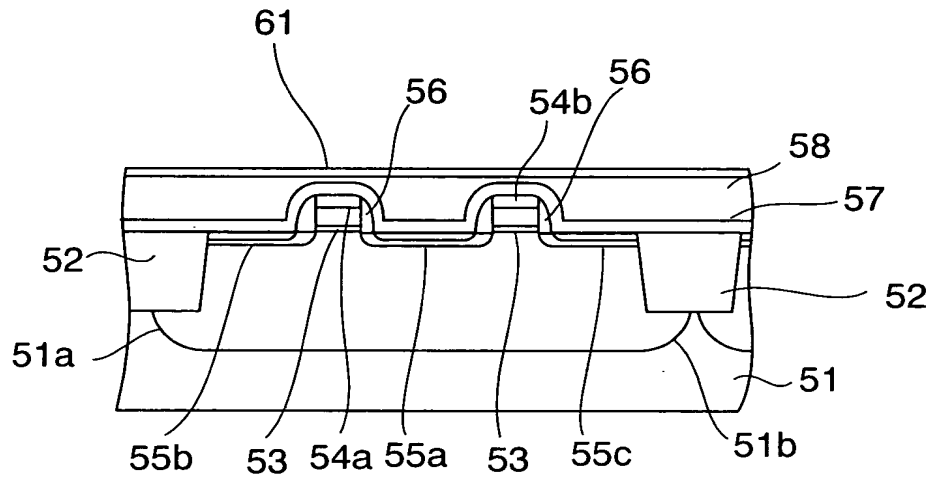


FIG. 21B

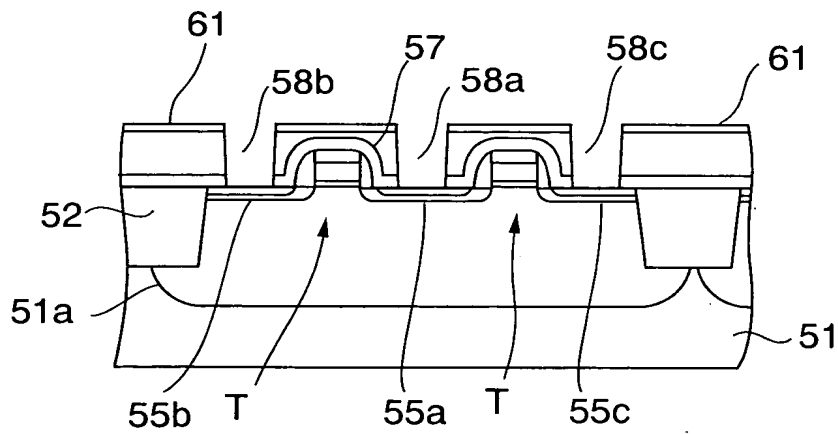


FIG. 21C

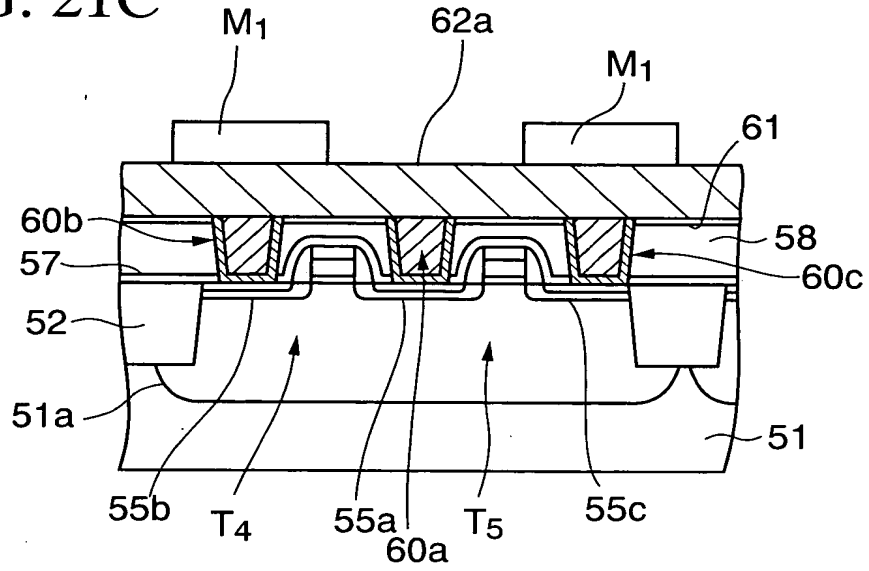


FIG. 21D

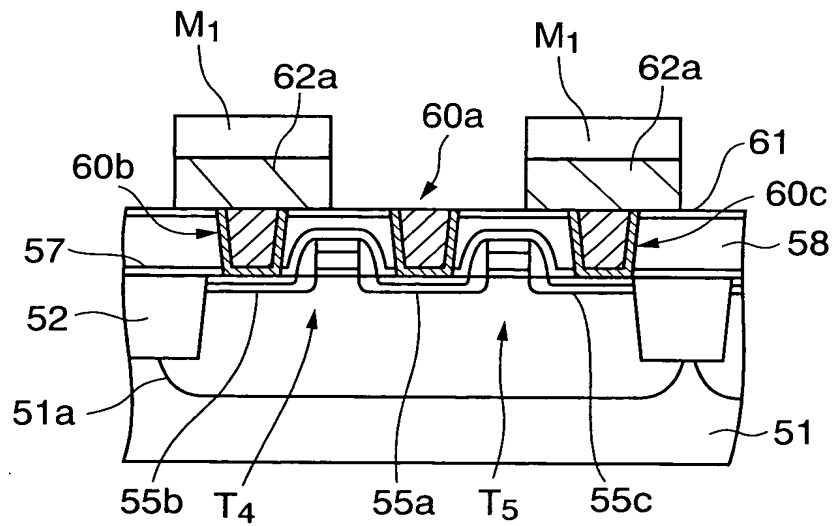


FIG. 21E

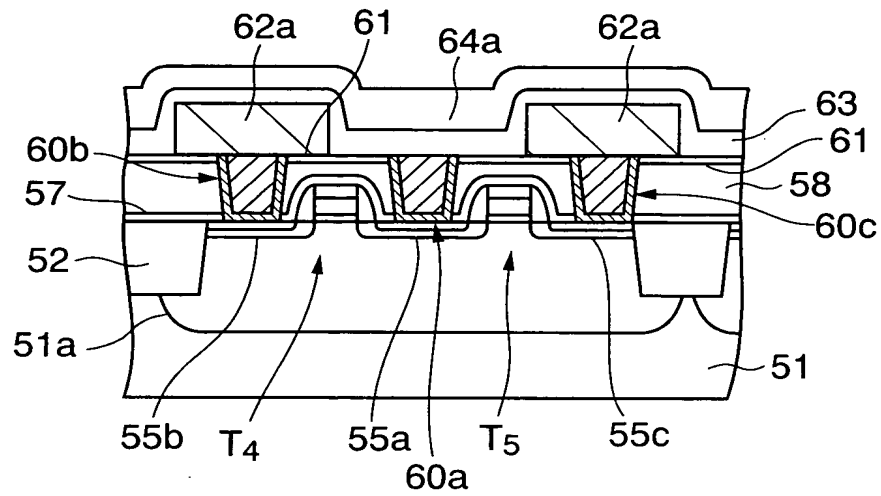


FIG. 21F

